



HIGHLIGHTING SOUTH BETHLEHEM

Architectural Lighting Master Plan

Prepared for:

THE CITY OF BETHLEHEM

and

**The Architectural Lighting Committee of the
South Bethlehem Historical Society**

By:

BRINJAC ENGINEERING, INC.

114 NORTH SECOND STREET

HARRISBURG, PENNSYLVANIA 17101

PROJECT MANAGER: SHAWN GOOD, P.E., L.C.

JOB CAPTAIN: BEN BASOM, E.I.T.

DECEMBER 4, 2002



ACKNOWLEDGEMENTS

The author wishes to express his gratitude to those who have made this report possible.

Special thanks go to the Architectural Lighting Committee, a subcommittee of the South Bethlehem Historical Society. Without the time and dedication of these members this project would not have been possible. The Committee includes:

Jim Burns, formerly of PPL Corp

Steven Glickman, architect and South Bethlehem Historical Society board member

Sally Handlon, president, South Bethlehem Historical Society

Tony Hanna, Director of Community and Economic Development, City of Bethlehem

Darlene L. Heller, Director of Planning and Zoning, City of Bethlehem

Joseph McCarthy, Holy Infancy Church

Ken Smith, Community and Government Affairs, Lehigh University

Bob Thompson, resident and South Side Task Force member

Christine Ussler, Artefact Inc. and Historic Officer for City of Bethlehem

Sarajane Williams, chairperson, Planet Harp

The Committee also wishes to acknowledge Donald T. Cunningham, Jr., Mayor of Bethlehem, City Council members, the AIA Eastern Pennsylvania Chapter, and individual private contributors. Without their support and funding, this report would not have been possible.

In addition, thanks go to Andrew Hoff for his expert photography skills on display throughout this report; Maria Ripepi whose help in organizing and doing graphical layout was invaluable; Jody Lasecki for her excellent skills in data processing; and Ben Basom for his assistance in review and edit, technical assistance, and effort as Job Captain.



TABLE OF CONTENTS

	PAGE
ACKNOWLEDGEMENTS	3
TABLE OF CONTENTS	5
HOW TO USE THE ARCHITECTURAL FACADE LIGHTING MASTER PLAN	7
PREFACE	9
<input type="checkbox"/> Why a Master Plan?	
CHAPTER 1 - Architectural Facade Lighting Design Principles	11
<input type="checkbox"/> People Places - Revitalizing the Charm of Downtown	
<input type="checkbox"/> Objectives for Good Facade Lighting	
* Distinctive Skyline Views - Sense of anticipation	
* Orientation - City layout revealed in a cogent way	
* Streetscape - Emphasize the local details of each street	
* Civic Pride - Create a variety of moods in accordance with each area's history, architecture, and function	
CHAPTER 2 - Responsive Lighting Design Principles	15
<input type="checkbox"/> Community Responsive Design	
* Light Trespass	
* Light Pollution	
* Appropriate Community Design	
<input type="checkbox"/> Owner Responsive Design	
* Maintenance	
* Energy	
* Cost	
<input type="checkbox"/> Design Principles	
* Illumination (quantity of light)	
* Limiting Glare	
* Use of Color	
* Use of Texture	
CHAPTER 3 - Lighting Techniques	19
<input type="checkbox"/> Methods of Architectural Lighting	
* Floodlighting (Flat / Grazing)	
* Selective Highlighting	
* Silhouette	
* Transmitted Luminance	
* Delineation	
* Point (Loci)	
* Ornamental	
* Combination	
CHAPTER 4 - Views and Vistas	25
<input type="checkbox"/> The South Side of Bethlehem from a Distance	
* From the Hill to Hill Bridge	
* From the Fahy Bridge	
* From Lehigh University Campus	
* From St. Michael's Cemetery	



TABLE OF CONTENTS

(CONTINUED)

PAGE

CHAPTER 5 - A Lighting Plan	43
<input type="checkbox"/> Map of Downtown Structures	
<input type="checkbox"/> Lighting Concepts for Individual Buildings	
CHAPTER 6 - Implementation	63
<input type="checkbox"/> Prioritizing the City	
<input type="checkbox"/> Phasing Each Building	
<input type="checkbox"/> Mock-ups and User Evaluations	
<input type="checkbox"/> Covenants and Ordinances	
<input type="checkbox"/> Preventative Maintenance	
<input type="checkbox"/> Updating the Master Plan	
<input type="checkbox"/> Other Improvements to be Studied	
<input type="checkbox"/> Summary	
APPENDICES	71
<input type="checkbox"/> A - Checklist	
<input type="checkbox"/> B - Photography Credits	
<input type="checkbox"/> C - Maps	



HOW TO USE THE SOUTH BETHLEHEM ARCHITECTURAL FACADE LIGHTING MASTER PLAN

It is highly recommend that the reader follow one of the suggested paths of investigating this master plan. The information has been laid out in a logical order to be read as a complete book. However, various readers will have differing levels of interest in all of the material that is presented in this plan. Therefore, we suggest choosing one of the following methods of approaching the plan:

For Architectural Lighting Committee Members

- Start at the Preface and read through the plan.
- Take time to carefully review the concepts presented in Chapters 1 and 2; they are the foundation of this plan.
- Learn the basics of each technique in Chapter 3 and be prepared to discuss them with others.
- Carefully review Chapter 4 to understand how the South Side is viewed from a distance and how the buildings visually interrelate with one another.
- Chapter 5 should be used for reference purposes.
- Read and understand Chapter 6. As the plan is implemented, building owners may need help with some of the topics.

For Building Owners

- Read the Preface and Why Master Plan section to understand the history and objectives of this plan.
- Skip ahead to Chapter 5; read the introduction and find your building (if you haven't already). Please remember, only selected buildings have been featured in this plan, but all building owners are encouraged to participate.
- Go to Chapter 3 and review the techniques used on your building.
- Look through Chapter 4 and find how your building or surrounding structures affect the skyline views of South Bethlehem.
- Continue by finding buildings that are close to yours or that simply interest you in chapter 4; then locate their design concepts in chapter 5, and research each technique in Chapter 3.
- To learn more about the objectives of this plan, go back and read Chapter 1.
- To learn about the design process and things your lighting designer should be considering, read Chapter 2, including Owner and Community Responsive Design.
- To learn about phasing, mock-ups, and maintenance, turn to Chapter 6.



For Lighting Designers

- Read the Preface and Why Master Plan section to understand the history and objectives of this plan.
- Read Chapter 2 to understand some of the design issues.
- Skip ahead to Chapter 5; read the introduction and find the building you are lighting. Please remember, only selected buildings have been featured in this plan, but all building owners are encouraged to participate.
- Go to Chapter 3 and review the techniques used on your building.
- Look through Chapter 4 and find how your building or surrounding structures affect the skyline views of South Bethlehem.
- Continue by finding buildings that are close to yours in chapter 4; then locate their design concepts in chapter 5, and research each technique in Chapter 3.
- Keep in mind that this plan outlines concepts for a cohesive yet interesting cityscape; the designer must use appropriate judgment after reviewing all the information contained in this plan.
- For additional information, the designer should review Chapters 1 and 6.

For Community Members

- Read the Preface and Why Master Plan section to understand the history and objectives of this plan.
- Look through Chapter 4 to better understand South Bethlehem's Views and Vistas and to identify buildings of interest.
- Look up any buildings that are of interest in chapter 5 to see their potential lighting effects.
- Go to Chapter 3 to gain a better understanding of each lighting technique.
- To learn more about the objectives of this plan, go back and read Chapter 1.
- To learn about the design process and things a lighting designer should be considering, read Chapter 2, including Owner and Community Responsive Design.
- To learn about phasing, mock-ups, and maintenance, turn to Chapter 6.





PREFACE

In May of 2002, Brinjac Engineering, Inc. was commissioned by the City of Bethlehem to develop an architectural lighting master plan for South Bethlehem. The purpose of the plan is to give structure and direction to the outdoor vision set forth by the Architectural Lighting Committee of the South Bethlehem Historical Society. We hope that the plan you are now reading offers clear rationale and guidance for implementing a lighting program, one that accentuates the varied architectural features of South Bethlehem, which is so rich in community, industrial, and ethnic history.

From the beginning, a strong motivation for lighting the South Side was the community's awareness that the city's history is dramatically shown in the style and function of the constructed world. The Lehigh Canal and Bethlehem Steel facilities, dating from 1829, reflect great chapters of American industrial history. The skyline of church steeples testifies that from 1850, South Bethlehem recapitulates better than most American cities the full pattern of ethnic immigration to this country from eastern and southern Europe. These artifacts deserve not just preservation, but celebration as well.

In 1999, South Side residents and business owners discussed ideas for architectural lighting as a way to promote the South Side and to increase safety. The concept was taken to additional community members, and the Architectural Lighting Committee was formed. In February of 2000, the Committee held a community meeting to gauge public response to the program, and they found the response quite favorable. Indeed, Lehigh University and one large South Side church were already planning to illuminate historic structures.

The Architectural Lighting Committee's program was very timely. In the summer of 2000, the City initiated the South Side Master Plan. Several public meetings were held to encourage community participation. The South Side Master Plan was developed by the same firm that had recently completed a Master Plan for Lehigh University. Along with creating stronger ties with the University, the Master Plan also provided recommendations on issues such as economic development, capital improvements, housing, safety, design guidelines, community relations, and public policy.

Architectural and streetscape lighting was identified by the South Side Master Plan as an issue to be addressed. With the strong public support for the overall Master Plan, the Architectural Lighting Committee and the City of Bethlehem have commissioned this Lighting Master Plan to continue the planning process recommended in the South Side Master Plan. Along with the various community members involved as part of the Committee, the design team also gathered public opinions from community members while surveying. In addition, a public presentation was held to gather and review community response to the Lighting Master Plan.



Why a Master Plan?

The many independent solutions to architectural lighting projects do not necessarily lead to well designed streetscapes that function as a city. Master planning can help set a precedent and establish guidelines so that the ongoing process of incremental growth does not lead to visual chaos and fragmentation.

A design for individual facade lighting projects based solely on whim or personal preference would provide no guidance for future lighting projects. At present, everyone is entitled to light their buildings as they wish, and individual lighting design and illuminated signage can pop up at any time. When combined, all of these luminous sources can create a visually chaotic scene that is far from attractive. That is why the thoughts, designs, and ideas presented in this report are based on research, history, and principles of human perception. It is in the underlying data that future decisions may be based.

The plan does not merely focus on the technical aspects of lighting according to standard practice, economy, and efficiency, but rather on creating exciting and attractive environments for people, where they can feel safe and secure. It is a common sense, humanistic approach with technical backup.

Finally, this master plan should be thought of as a work in progress; a living document that grows in future years and becomes a piece of an entire outline with other development plans for an improved downtown.



Figure 0.1 *Hill to Hill Bridge*

As the redevelopment of South Bethlehem occurs with Beth Works and the implementation of the South Side Master Plan, the streetscapes of the town will change. It is vital to this community that the night environment remain friendly, inviting, and comfortable for everyone to enjoy. Whether it is a college student walking home from Tally Ho or a family visiting the Bridgeworks Restaurant, everyone should feel secure and welcome in town after dark. A clear lighting master plan with community support and well written lighting ordinances can help ensure a visually pleasing and inviting result.